

## Ideas for Portable VHF/UHF Antennas

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There has been a lot published about portable VHF/UHF antennas, and I have enjoyed building a few. These come in handy when a ham group supports public service events or provides emergency communications. And if no repeater is available, rubber ducks just don't cut it for simplex work. Another advantage to using an external antenna is that you can often use a lower power level on your HT and a battery charge will last a lot longer. This article does not contain detailed building instructions. Rather, its purpose is to mention some ideas that might help you design and build your own antenna.

Your antenna will need a base to hold it up. Anything that can hold a pole upright is good for this. My favorite is a cheap speaker stand (like rock groups use) that I got a few years ago from a discount outlet. It's one inch diameter upright just slips inside standard PVC pipe. My wife bought a deck umbrella, and it's base would be great for holding a mast (but I can't have it). You can fill a 5 gallon bucket with concrete, with a pipe centered in the middle—but how portable this is depends on your strength. For lightweight systems, a camera tripod might be used somehow. Bases can be fashioned from PVC pipe, with an H pattern being popular since you only need tees. Make it so it breaks down for transport.

Above the base is the mast. Painter poles and PVC pipe work well here. I have three four-foot sections of PVC with wooden dowel inserts to connect them. These are held together with machine screws of stainless steel or nylon. (Although you can use cheap hardware, the extra cost of non-corroding materials is worth it, to my mind.) If you can transport it easily, long single pieces of PVC are better than sectioned masts. I prefer my mast material to be non-conductive, but this doesn't really matter for some antennas. You may want to think about guying arrangements if want a tall mast.

You will need to pay some attention to how the antenna is connected to the mast. If you are building your own, be sure to think this through before cutting material. You can use some mobile "universal" mounts which clamp onto a pipe or use U-bolts for attachment. Published antenna plans usually include some mounting arrangements.

The antenna itself can be single or dual band, omni-directional or directional. I like having one of each! For FM work, all the antennas are vertically polarized. If you are net control and simplex, obviously omni-directional is best. Directional antennas will give you more gain in a particular direction so you can use less power than with an omni.

An easy omni-directional antenna can be built using a mobile antenna and a "base antenna adapter." The adapter is just a mount (e.g., NMO) with coax connection that includes three or four radials sloping downward. You just need to bolt or clamp it to the end of the mast and you are in business. Another version of this is homemade. Use a piece of aluminum plate with a female BNC chassis mount jack and four radials made from solid house wire with ring terminals crimped to one end. Put a BNC telescopic HT antenna (quarter, half, or 5/8 wave) on the jack and solder coax of your choice to the other side of the jack. For two meters or a dual-bander, the radials should be 19.25" long.

A J-pole is an excellent choice for an omni. These can be purchased or made from copper pipe, aluminum rod, 300 ohm TV twinlead, or 450 ohm ladder line. I build a 2 meter one from 450 ohm ladder line using directions off the Internet. I then enclosed it in thin-wall PVC pipe (not the standard thick-wall stuff) and matched it to my top PVC mast section. By having it enclosed it is more weather-proof.

Speaking of weather-proofing, you should keep open ends of coax away from rain, as moisture can wick up into the coax and eventually ruin it. For my portable antennas I like to use the adhesive Goop for weather-proofing.

For a directional antenna, a 3-element Yagi is a popular choice. You can build one with a wood beam and with elements made from uncoated brazing rod. (Brazing rod is a lot cheaper than brass rod and is available in 3 foot lengths at larger hardware stores.) The "Tape Measure Yagi," although originally intended to be a fox hunt antenna, could be end-mounted and used. I purchased a log-periodic dual band antenna from Elk Antennas that works great, and I also purchased a 2 meter four-element quad that is lightweight and made from PVC and graphite arrow shafts.

Well, those are some ideas for portable FM antennas. Try building one and have some fun.